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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/670,613	09/27/2000	Ronald S. Rahmel	SAIC0009	6120

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KILPATRICK STOCKTON LLP  
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WASHINGTON, DC 20005

EXAMINER
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NGUYEN, SIMON

ART UNIT	PAPER NUMBER
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2685

DATE MAILED: 11/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/670,613

Applicant(s)

RAHMEL ET AL.

Examiner

SIMON D NGUYEN

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 27 September 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-31 and 35-37 is/are rejected.
- 7) ☒ Claim(s) 32-34 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2, 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 7, 11, 28-29, 35-37 are rejected under 35 U.S.C. 102(e) as being anticipated by Tabanou et al. (6,426,917).

Regarding claim 1, Tabanou discloses a sensing unit communication system for harvesting energy from ambient radio frequency, comprising: a first subsystem having at least one antenna for receiving ambient RF signals; a second subsystem having circuitries for converting RF energy from the received RF signals to DC electrical power; and a third subsystem having a power storage device for storing the converted DC electrical power as charged by the second system (column 33 lines 46-64).

Regarding claim 11, this claim is rejected for the same reason as set forth in claim 1, wherein the first system receives an electromagnetic energy (first type of ambient energy) (column 9 lines 39, 55) and RF signal (second type of ambient energy) (column 33 line 50).

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Regarding claim 28, this claim is rejected for the same reason as set forth in claim 1, wherein the antenna receives an electromagnetic energy (column 9 lines 39, 55).

Regarding claim 7, Tabanou further discloses a rectifying circuit (column 25 line 58) and a trickle charger for charging the DC power to a battery (column 37 lines 52-63).

Regarding claim 29, Tabanou further discloses the power storage component is completely charged (column 33 lines 53-64).

Regarding claim 35, this claim is rejected for the same reason as set forth in claim 28.

Regarding claims 36-37, Tabanou discloses the storage component is apart from the device and the power is drawn from the power storage components to power the device (column 33 lines 45-63).

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tabanou et al. (6,426,017) in view of Epp et al. (6,369,759).

Regarding claims 2-5, Tabanou fails to disclose an array of antennas.

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Epp discloses an array of antennas for receiving RF signals and converting to DC voltages (column 1 lines 21-23, column 2 line 31) wherein the antenna is a wideband, omni-directional antenna optimizes to receive the RF signal in a selected frequency range (column 3 lines 1-8, column 5 line 60 to column 6 line 48, column 11 lines 22-30). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to have Tabanou, modified by Epp to receive signals from different directions in order to capture more signal energies than use only one antenna which, in turn, generates more DC power.

5. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tabanou et al. (6,426,017) in view of Mickle et al. (6,289,237).

Regarding claim 6, Tabanou fails to disclose an ASIC.

Mickle discloses a communication device for receiving RF signals and converting the RF signals to DC power (column 5 lines 1-7) wherein circuitries are formed on an ASIC (fig.2, column 4 line 24). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to have Tabanou, modified by Mickle to combine different circuits in one chip in order to reduce the size of the device.

6. Claims 8-10, 30-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tabanou et al. (6,426,017) in view of Gartstein et al. (6,198,250).

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Regarding claims 8-10, 30, Tabanou discloses the battery to be used to store the power. However, Tabanou fails to disclose the battery having a plurality of battery micro-cells.

Gartstein discloses a multi-cell battery for storage voltages (fig.6). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to have Tabanou, modified by Gartstein to store more DC power in order to increase time for activity of the device.

Regarding claim 31, Tabanou further discloses the power storage is used to provide for the device (column 33 lines 53-64).

7. Claims 12-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tabanou et al. (6,426,017) in view of Jarchow et al. (6,597,465).

Regarding claims 12-15, 17-19, Tabanou fails to disclose the system having a solar cell for converting solar energy to power voltage.

Jarchow discloses an apparatus for converting RF signals as well solar energies to DC voltage for use in the apparatus (column 9 lines 18-28, column 13 lines 54-63). It should be noted that the Jarchow system including a two different kinds of energy to be converted, therefore, it is obvious to have two transducers converting the RF signals and the solar energy, respectively. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to have Tabanou, modified by Jarchow to harvest different sources of energies in order to improve the power supply system.

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Regarding claim 16, the modified Tabanou does not disclose a piezoelectric transducer. It should be noted that a piezoelectric transducer is used for converting an acoustical energy is known to one skilled in the art. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to have the modified Tabanou to use a piezoelectric transducer in order to improve the harvesting of energy.

8. Claims 20-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mickle et al. (6,289,237) in view of Tabanou et al. (6,426,017).

Regarding claim 20, Mickle disclose a wireless communication (fig.3); a first antenna 100 for receiving communication signals (antenna goes to a data transceiver 108, 110), and the antenna 100 for receiving ambient RF signal (go to RF to DC power supply); communication processing circuitry (#94 of fig.3); a first power source (102) and an energy conversion (column 5 lines 1-11). However, Mickle fails to disclose energy storage for storing energy charged by the DC.

Tabanou discloses a sensing unit communication system for harvesting energy from ambient radio frequency, comprising: a first subsystem having at least one antenna for receiving ambient RF signals; a second subsystem having circuitries for converting RF energy from the received RF signals to DC electrical power; and a third subsystem having a power storage device for storing the converted DC electrical power as charged by the second system (column 33 lines 46-64). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to have Mickle,

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modified by Tabanou to store RF to DC voltage conversion in order to self-generating power source.

Regarding claims 21-27, in the modified Mickle system, Mickle further discloses a switching circuitry for receiving an activation from the antenna (column 5 line 17), monitoring (column 5 lines 40-45) and wherein Tabanou discloses the storage subsystem for storing the RF/DC power conversion, wherein the storage DC power is used to provide power to the switching circuitry (column 26 line 40, column 27 lines 3, 17, column 33 lines 19-41).

### ***Allowable Subject Matter***

9. Claims 32-34 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art of record does not specifically discloses the steps of charging the remaining micro-cell of battery in the N\*M array that is not in the charged P\*Q sub-array; substituting the P\*Q sub-array with one remaining micro-cell of battery once the P\*Q sub-array is depleted of power.

### ***Conclusion***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The Phillips, Sr. (4,685,047) discloses an apparatus for converting radio frequency energy as well as solar energy to DC power (column 1 lines



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37, 57-62, column 2 lines 50-67); the Fitzsimmons et al. (4,360,741) discloses an antenna system that has circuitries for converting solar energy and RF signals to DC power, wherein the DC power is stored in an energy storage device such as batteries (column 5 line 54 to column 6 line 22).

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Simon Nguyen whose telephone number is (703) 308-1116. The examiner can normally be reached on Monday-Friday from 7:00 AM to 4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward F. Urban, can be reached on (703) 305-4385.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 306-0377.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

Or faxed to:

(703) 872-9314, (for formal communications intended for entry)

Hand-delivered response should be brought to Crystal Park II,  
2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).


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Simon Nguyen

October 24, 2003

A handwritten signature in black ink, appearing to read "Simon Nguyen". The signature is written in a cursive, flowing style with a large initial "S" and a stylized "N".